DOCUMENT RESUME

ED 062 501 UD 012 399

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TITLE Application of an Anthropological Technique to Desegregated Schools.
PUB DATE Apr 72
NOTE 12p.; Paper presented at the annual meeting of the American Educational Research Association, Chicago, Ill., April 1972

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Caucasian Students; *Classroom Integration; *Classroom Observation Techniques; Classroom Research; *Elementary School Students; Group Status; *Interaction Process Analysis; Negro Students; *Peer Relationship; Racial Integration; School Integration; Social Integration; Socioeconomic Status; Sociometric Techniques; Student Behavior

ABSTRACT

This study, one of a series investigating dyadic infracommunication in natural, academic, and laboratory settings, utilizes a simple observation technique such as that employed by anthropologists living among members of a society or subcultural group, observing and recording their behavior patterns, including their communication modes. Subjects were male and female pupils in a desegregated elementary school with a student body composed of 32 per cent lower class blacks and 68 per cent middle class whites. The sample ratio was 42 per cent black and 48 per cent white. Interpersonal distance and angle of orientation, gaze direction, status, position, locomotion, sex, race, smile, and audible communication of dyadic subjects were the variables observed. A simple observation technique was used to gather data, with the observer present--sitting or standing in the least conspicuous place available. Subjects were not aware of the nature of observer's interest and recording. Selection of dyads for observation was made by the sequential scan method, with the observer noting the nearest pupil. Five hundred dyads were observed. (Authors/JM)

ED 062501

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APPLICATION OF AN ANTHROPOLOGICAL TECHNIQUE TO DESEGREGATED SCHOOLS

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Based on the theories and work of anthropologists Hall (1966) and Birdwhistell (1970), the DIAD system was developed to facilitate observation, classification and recording of dyadic infracommunication such as position, locomotion, interpersonal distance and angle of orientation, gaze direction, smile and audible transmissions. With the DIAD, simple observations were made of 500 dyads of B/w, M/F elementary pupils in class and out, substantiating the hypothesis that the pupils were integrated. Integration was defined as an equilibrium of dyadic infracommunication within sex and within and across race.

Results could influence program planning and reinforce understandings of socio-psychological development.

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VD 012399

Paper presented at the meetings of the American Educational Research Association, Chicago, 1972.

Introduction

An Anthropological data collection method was amplified and applied to a critical area of education, integration, in this research, which is one of a series of studies investigating dyadic infracommunication in natural, academic and laboratory settings.

The present study utilizes a simple observation technique such as that employed by anthropologists living among members of a society or subcultural group, observing and recording their behavior patterns, including their communication modes.

Birdwhistell (1970) holds that communication is multimodal, and takes place in simultaneous, alternate and/or overlapping transmissions along many infracommuncation channels. Transmissions along one channel may amplify, contradict or otherwise modify meaning of transmission along another infra-communication channel. The sum of transmissions along infracommunication channels makes up the complete message of the moment. Birdwhistell (1968) stresses that meaning is transmitted by body motion in a kinesic system paralleling verbal communication, the two disciplines of kinesics and linguistics making up paralanguage. Hall (1970) developed the science of proxemics, man's use of space, emphasizing the messages conveyed through differential use of space. He points out that use of space is culturally patterned, as is communication and behavior, and that behaviors appropriate in a given context for one subculture might be highly inappropriate for another subcultural group. Based on the theory and work of these two anthropologists, the Dennis Infracommunication Analysis Device (DIAD) was

developed for use in observing, classifying and recording dyadic infra-communication and ethographic segments.

Interpersonal distance and angle of orientation, gaze direction, status, position, locomotion, sex, race, smile and audible communication of dyadic subjects were the variables observed in this research. Though there have been previous studies of some of these variables combined (Hall, 1959, 1963, 1964; Scheflen, 1964; Sommer, 1962), this was the first to examine all those communication modes in dyadic interactions between Black and white boys and girls.

Other researchers have found that a positive relationship exists between likeing and gazing at the eyes of another (Goldberg, Kiesler and Collins, 1969), that interpersonal distance in a dyad is a measure of the intimacy of the relationship between the participants (Hall, 1966), and that an equilibrium of eye contact and distance exists for a dyad if the relationship between the partners is unchanged (Argyle and Dean, 1965). In addition, distance and angle of orientation in a dyad has been investigated in a laboratory situation (Pellegrini and Empey, 1970).

Knowledge of how individuals interact, as well as an overview of the literature led to the assumption that it would be possible to accurately describe dyads in natural school settings and to compare interactions with a view to making inferences about how people feel about each other from how they act with each other. Further, it was assumed that if it were possible to accurately record what takes place in dyads between people who are classed as Black or white, boys or girls, it could be determined to what extent infracommunication is different within or across race and sex; that is, to

observe integration in a given sample. For purposes of this study, integration means that present state of equilibrium in a group in which infracommunication is not significantly different within sex within race than infracommunication within sex across race.

Method of Observation

Subjects were male and female pupils in a desegregated elementary school with a student body composed of 32% lower class Blacks and 68% middle class whites. The sample ratio was 42% Black and 58% white.

A simple observation technique was used to gather data, with the observer present, sitting or standing in the least conspicuous place available and refraining from initiating verbal, tactile or eye contact with the children as they interacted in the classroom and outside, in halls, library, cafeteria and grounds: Subjects were not aware of the nature of observer's interest and recording.

Selection of dyads for observation was made by the sequential scan method, with the observer noting the nearest pupil. If the pupil was interacting with another, data was recorded and observer attention was focused on the pupil nearest the first dyad. If that pupil was interacting with another, data was recorded, and observer attention directed to the next pupil. If a pupil was not in dyadic relationship at the time, no data was recorded, and the pupil adjacent or nearest was attended. When all pupils in an area had been scanned for dyadic interaction sequentially, the area was scanned again. 500 dyads were observed.

Subject race, sex, position and locomotion, gaze, audible transmissions, smile, kinesthetic communication, interpersonal spatial distance and angle of

orientation between the pair of interacting individuals were noted, classified, recorded and analyzed with DIAD. Observer reliability was over 90% for all variables.

Findings

Randomly accessing classrooms and times, the observer collected data on one thousand child interactions with another child. This is, of course, five hundred dyads. The first step in the data analysis had to do with whether the interactions collected were distributed in the same manner as chance interactions, that is, were the observer's two-at-a-time distributed in the same way as chance two-at-a-time. Figure 1 demonstrates that these were not.

	Number of Dyads			
	Expected		Actual	
	n	Probability	n	Percentage
White to White	231	46.2%	219	43.8%
White to Black Black to White	218	43.5%	142	28.4%
Black to Black	51	10.2%	139	27.8%

Figure 1. Number of dyads expected according to the overall school ratio (68% W, 32% B) vs. number obtained, showing probabilities and percentages, respectively.

These data, while mathematically elegant, are only one way of demonstrating whether or not Blacks and whites are integrated. Another way of looking at the same problem would be to take one child and decide what the probabilities would be he would pick another child of the same or different race. This would tell us that if a child interacts, the probability that the

other child is white is 68%. In fact, the data in Figure 1 demonstrate that the dyadic distribution was not as expected. That this is partially because the sample and participation of children differs is shown when you compare the left side of Figure 1, based on the school ratio of (68% B, 32% W) to Figure 2 which is based on the ratio of white/Black interacting (52-48) in this sample.

	Number of Dyads			
	Expected		Actual	
	n	Probability	n	Percentage
White to White	168	33.6%	219	43.8%
White to Black Black to White	243	48.7%	142	28.4%
Black to Black	88	17.6%	139	27.8%

Figure 2. Number of dyads expected according to proportion of children in the sample (58% W, 42% B) vs. number obtained, showing probabilities and percentages, respectively.

We find from Figure 2 that while Black children interacted with other Black 50% more than expected, white children interacted with other whites one-third more than chance, and interaction across race was substantially lower, only 58% of the chance prediction, taking the sample ratio. Children in the sample, whether compared to the school ratio (68% W, 32% B) or to the sample ratio (58% W, 42% B), did not, in their choice of dyadic partner, touch at the same frequency that they chose partners, nor did they touch at the same frequency as expected by chance. This suggests that the integration distribution expected from the desegregation ratio (60 to 32) in the school was not found for one measure.

In terms of pupils touching pupils, Figure 3 contains touch frequencies expressed as actual number of touches, percentage of touches to number of

	WF Number Touching %	WM Number Touching %	BF Number Touching %	BM Number Touching %
WF (n)	18, 26% (68)	16, 26% (61)	26, 47% (55)	8, 47% (17)
WM (n)		30, 33% (90)	10, 46% (22)	32, 67% (48)
BF (n)			15, 24% (63)	8, 22% (36)
BM (n)				23, 58% (40)
Within Sex (n)	144, 77% (186)			
Within Race (n)	110, 59% (186)			

Figure 3. Distribution of dyads (in parentheses), number of dyads touching and percentage of touching dyads within cells, ignoring quality of contact.

dyads interacting, and number of dyads interacting, in each cell combination. Touching means at zero distance, so that person initiating touch is ignored for the present. Zero distance, or touching, occurred in 37.2% of dyads. For White/White dyads the touching percentage was 29.2, for Black/Black, 33.1, and for Black/White, 34.7% touched. The by-race, ignoring sex summary in Figure 4 is similar to the format of Figures 1 and 2, and will help us to understand Figure 3. Figure 4 shows that ignoring sex, pupil dyads across

	Expected				Actual	
	School Ratio		Sample Ratio			
	n	Probability	n	Probability	n	Percentage
White/White	85	45.6%	62	33.6%	64	29.2%
White/Black Black/White	81	43.6%	91	48.7%	76	34.7%
Black/Black	19	9.9%	33	17.6%	46	33.1%

Figure 4. Number of dyads touching compared to expected number, with respective probabilities and percents (n-186).

race touched less often than predicted by the sample's racial proportions, White/White dyads did so as well, and Black/Black dyads touched twice as often as chance would predict. We thus have an indication that pupils were not integrated by race, as well as an intriguing finding that Black children touch (zero distance) more than do white children.

Figure 5 presents data that are more meaningful than the distributions presented so far. It contains the ten possible combinations of dyads, with median gaze, audible communication, and angle of orientation, as well as frequency of smiles and mean distance in cm.

Figure 5. Subject gaze, smile and audible transmissions, with dyadic spatial distance and interpersonal angle of orientation.

By Person 1	By Person 2	Median Gaze 1	Median Gaze 2	Median Audible 1	Median Audible 2	Frequency Smiles Transmitted 1	Frequency Smiles Transmitted 2	Median Angle of Orientation	Mean Dyadic Spatial Distance in cm	Number of Dyads
WF	WF	3	3	3	2	6	3	3	42	68
WF	BF	4	3	3	3	1	3	2	24	55
BF	BF	4	4	3	4	1	1	3	54	63
WM	WM	3	4	2	2	4	9	3	13	90
WM	BM	4	3	3	3	0	1	3	11	48
BM	BM	3	4	3	4	3	1	3	32	40
WF	WM	3	4	2	3	0	0	2	79	61
WF	BM	3	3	3	3	0	0	2	26	17
BF	WM	3	3	3	3	0	0	2	35	22
BF	BM	3	4	3	3	0	2	2	72	36
For all dyads		3	3	3	3	35		2	42	500

Gaze ranges from 1 = looking at to 6 = away
Audible ranges from 1 = whisper to 2 = low
Talk, 3 = talk of average loudness; 4 = loud talk
Angle of orientation between dyadic partners ranges from 0 = facing to 4 = side by side and 8 = back to back.

The gaze scale runs from 1 = looking at to 6 = looking away. For example, in the WF-BF (White Female, Black Female) dyad in the second row, the median gaze of the White Female at the Black Female was 4. The median BF to WF gaze was 3. These data are found by determining that in row 2, for person 1 (WF) the median gaze at person 2 (BF) in the column 'Median Gaze' under number 1 was a 4. Similarly, the person 2 (BF) median gaze at person 1 (WF) was 3, found in row 2 of the column titled 'Median Gaze', column 1 under number 2. Column 2, Median Audible, is read in the same manner, and in general demonstrates that across or within race and sex, loudness was similar.

Minor differences noted in Column 2 show that BF_BF and BM_BM dyads interacted with louder talk than did other dyads, especially the WM-WM and WF-WF. Overall, Median Gaze and Median Audible demonstrate that there were no differences across and between races.

The third column of Figure 5 shows that there were few smiles across both race and sex, the most smiles occurred among whites (WF-WF and WM-WM), next among black males (BM-BM), and among WF-BF dyads. Figure 6 represents within sex, across and within race data found in Figure 5 for smiling.

	Number of Dyads					
	Expected*		Smiling		Interacting**	
	n	Probability	n	Percentage	n	Percentage
White to White	12	33.6%	22	63%	15	43.8%
White to Black Black to White	17	48.7%	5	14%	10	28.4%
Black to Black	6	17.6%	8	23%	10	27.8%

*On 58-42 ratio of W to B
**Derived from Figure 2

Figure 6. Smiling frequency distribution compared to pupil population and dyad distribution.

Taking the small and unstable incidence of smiling in dyads, we find that the low incidence of cross-race smiling is more striking. Figure 4 shows, of course, that males across race did little smiling. This leads us to suggest that smiles are not distributed in the same ratio as expected either by the school or by the sample desegregation ratio.

Returning to Figure 4, we see that in the Median Angle of Orientation column, there was no difference, supporting the supposition that B/W, M/F pupils do not vary in angles of orientation to each other. The most interesting and intriguing column on this table contains distance measures. Here we see very clearly that across race dyads were closer together than same race dyads, for both sexes. For mixed sexes, the across-race dyads were again much closer together than the within-race across sex dyads. These distance findings, based on the 1,000 pupils, is much more convincing than smile, based on 35 incidences of 500 dyads containing 1,000 pupils.

New evidence has thus become available concerning the process of integration in terms of actual behavior of interacting children in natural academic settings. Sex differences by grade levels would reinforce basic understandings of sex-role typing and pre-adolescent social development.

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